AF/2621 IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT	:	Walid s. Ibrahim Ali et al.		
SERIAL NO.	:	09/817,981	EXAMINER	: Patrick L. Edwards
FILED	:	March 27, 2001	ART UNIT	: 2621
FOR	:	SYSTEM AND METHOD FOR OPTIMIZING CONTROL PARAMETER SETTINGS IN A CHAIN OF VIDEO PROCESSING ALGORITHMS		

APPEAL BRIEF TRANSMITTAL LETTER

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA. 22313-1450

Dear Sir:

Appellants respectfully submit three copies of a Brief For Appellants that includes an Appendix with the pending claims. The Appeal Brief is now due on December 28, 2004.

Appellants enclose a check in the amount of $500.00 covering the requisite Government Fee.

Should the Examiner deem that there are any issues which may be best resolved by telephone communication, kindly telephone Applicants undersigned representative at the number listed below.

Respectfully submitted,
Russell Gross
Registration No. 40,007

By: Steve Cha
Attorney for Applicant
Registration No. 44,069

Date: December 28, 2004

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Steve Cha, Reg. No. 44,069
(Name of Registered Rep.)

(Signature and Date)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re the Application

Inventor	:	**Ali, Waldi S.**
Application No.	:	**09/817,981**
Filed	:	**March 27, 2001**
For	:	**SYSTEM AND METHOD FOR OPTIMIZING CONTROL PARAMETER SETTINGS IN A CHAIN OF VIDEO PROCESSING ALGORITHMS**

APPEAL BRIEF

On Appeal from Group Art Unit 2621

Russell Gross
Registration No. 40,007

By: Steve Cha
Attorney for Applicant
Registration No. 44,069

Date: December 28, 2004

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Steve Cha, Reg. No. 44,069
(Name of Registered Rep.)

(Signature and Date)

TABLE OF CONTENTS

TABLE OF CASES

I. REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, U.S. Philips Corporation, and not the party named in the above caption.

II. RELATED APPEALS AND INTERFERENCES

With regard to identifying by number and filing date all other appeals or interferences known to Appellant which will directly effect or be directly affected by or have a bearing on the Board's decision in this appeal, Appellant is not aware of any such appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-24 have been presented for examination. All of these claims are pending, stand finally rejected, and form the subject matter of the present appeal.

IV. STATUS OF AMENDMENTS

The Amendment after Final Office Action filed September 10, 2004 has not been entered.

V. SUMMARY OF THE INVENTION

The invention is related to the field of video processing and more specifically to methods and systems for determining parameter settings for optimizing picture quality. In one aspect to the invention, the video processing system comprises a chain of video processing algorithms, an optimization unit, and an objective quality metric unit. An output video stream from the chain of video processing units is fed back to the objective quality metric unit wherein, the objective quality metric unit calculates a fitness value and provides the fitness value to the optimization unit. The optimization unit uses the fitness value to configure the control parameter settings for the video processing algorithms. The video processing system iteratively converges toward control parameter configurations that produce a very high quality video image. In one advantageous embodiment the optimization unit comprises a genetic algorithm unit that uses a genetic algorithm to perform the optimization process.

VI. ISSUES

The issues before this board are whether:

1. claims 1, 6, 18 and 19 are anticipated by Frisch (WO 00/33207) under 35 USC §102(a);

2. claims 2-5, 7-11 13-17 and 20-22 are unpatentable under 35 USC §103(a) over Frisch and Watanabe (USP no. 6,004,015); and

3. claims 12 and 23 are unpatentable under 35 USC §103(a) over Frisch and Watanabe and further in view of Sims (Artificial Evolution for Computer Graphics).

VII. GROUPING OF THE CLAIMS

With regard to the issues, claims 1-24 stand or fall together.

VIII. ARGUMENT

I. Rejection Under 35 USC §102(a) in view of Frisch

Claims 1, 6, 18 and 19 stand rejected under 35 USC §102(a) as being anticipated by Frisch (WO 00/33207). It is the examiner's position that Frisch discloses that a gene is a method for enhancing a digital image and that this gene comprises control parameters which are optimized using a genetic algorithm. The determination of a next generation gene parameter as disclosed by Frisch is analogous to the claimed "optimization" of a control parameter. Consequently, all of the limitations of the claimed "genetic algorithm unit" are disclosed in the Frisch reference.

Difference Between the Claimed Invention and the Primary Reference – Frisch

The present invention, as recited, for example, in claim 1, is a system for optimizing at least one parameter setting of at least one video processing algorithm among a plurality of video processing algorithms including an optimization unit comprising an algorithm for optimizing the at least one control parameter.

Frisch teaches a digital image improvement system through genetic image evolution wherein child images are evolved from a digital image using either predefined template genotypes or genotypes created through evolution. The evolution process includes a selection process wherein four child images are generated from a lead image and the user

manually adjusts parameters in each child image. The adjusted parameter child images are each assigned a fitness rating, by the user, when compared against the leader image and the child image associated with the highest fitness rating is used in the evolution of the digital images. Frisch further discloses that the "evolution continues by recombining the genotype of the child image that received the highest fitness rating with the leader [image] genotype." (see page 12, lines 26-27). Figures 8 and 9, which are shown herein in Appendix B, illustrate the recombination process taught by Frisch. Figure 8 illustrates that a leader genotype is combined with a child genotype to define a next generation genotype and Figure 9 illustrates the process of a next generation genotype which is produced as a weighted average of the leader gene parameter and the child gene parameter, where the weighting factor is the fitness parameter assigned to the child genotype (block 916).

Frisch Fails to Anticipate the Claimed Invention

The examiner, in the Final Office Action, as stated above, states that Frisch discloses that a gene is a method for enhancing a digital image and that this gene comprises control parameters which are optimized using a genetic algorithm. The determination of a next generation gene parameter is analogous to the claimed "optimization" of a control parameter. Consequently, all of the limitations of the claimed "genetic algorithm unit" are disclosed in the Frisch reference.

"Anticipation requires the presence, in a single prior art reference disclosure, of each and every element of the claimed invention, *arranged as in the claim*." Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added).

Contrary to the examiner's position, Frisch fails to disclose each and every element recited in claim 1. Frisch discloses a system to update parameters by using a weighted average of a leader and a child image, where the weighting factor is the highest fitness value associated with child images. Frisch teaches that "what constitutes the 'best' or 'most fit' image process is subjective and may differ among any two users because of the user's perception of color and personal preferences." (see page 11, lines 19-22). Hence, rather than teaching an optimizing unit capable of optimizing at least one control parameter, Frisch teaches a user-subjective trial and error method for determining a relative measure, i.e., fitness value for each of the child images and uses a weighted average between the lead image and the child image associated with the highest fitness value to evolve the lead image as a next generation image. Frisch continually evolves the digital image until an image acceptable to a desired user is achieved.

Frisch cannot be said to anticipate the present invention, as Frisch fails to disclose each and element recited in the claims. More specifically, Frisch fails to disclose an optimization unit capable of optimizing at least one control parameter setting. In this case, the examiner's analogy of Frisch's determination of a next generation image to the instant invention's optimization unit is not accurate as Frisch fails to disclose a method for optimizing the parameter. Rather Frisch merely provides a method for updating the image parameters.

In view of the above, applicant submits that claim 1 is patentable over the teaching of Frisch.

With regard to independent claims 6 and 18, these claims recite subject matter similar to that recited in claim 1 and these claims have been rejected by the examiner reciting the

same reason for rejecting claim 1. Hence, for the remarks made with regard to the rejection of claim 1, which are reasserted as if in full, applicant submits that claims 6 and 18 are also patentable over the teachings of Frisch.

With regard to claim 19, this claim depends from claim 18, which has been shown to include subject matter not recited by Frisch. Accordingly, claim 19 is also patentable over the teachings of Frisch by virtue of its dependency upon an allowable base claim.

In view of the above, applicant submits that claims 1, 6, 18 and 19 are patentable over the teaching of Frisch.

II. Rejection Under 35 USC §103(a) in view of Frisch and Watanabe

Claims 2-5, 7-11, 13-17 and 20-22 stand rejected under 35 USC §103(a) as being obvious over Frisch in view of Watanabe. The examiner contends that Frisch discloses a fitness value that characterizes the video quality and provides the fitness value to the genetic algorithm unit. However, "[Frisch] does not expressly disclose a unit for 'determining the fitness value.'" (See p. 4, item 6, Final Office Action, July 28, 2004). The examiner further contends that Watanabe discloses a fitness value and a unit for determining fitness values. "The fitness calculating section disclosed in Watanabe is analogous to the objective metric unit as recited in the claim. It would have been obvious ... to modify Frisch's video processing system, which receives the fitness value directly from the user, by dedicating a unit for determining the fitness value as taught by Watanabe. Such modification would have allowed for a system that automated the determination of fitness values and thereby reduced the user's burden."

Difference Between the Claimed Invention and the Cited References

The present invention, as recited, in claims 2 for example, recites an objective quality metric unit coupled to the optimization unit for determining a fitness values.

Frisch, as discussed above, teaches a digital image improvement system through genetic image evolution wherein child images are evolved from a lead digital image using either predefined template genotypes or genotypes created through evolution. The evolution includes a selection process wherein four child images are generated from a lead image and the user then manually adjusts parameters in each child image. The adjusted parameter child images are each assigned a fitness rating when compared against the leader image and the highest fitness rating is used in the evolution of the digital images. Frisch discloses that the "evolution continues by recombining the genotype of the child image that received the highest fitness rating with the leader [image] genotype." (see page 12, lines 26-27). Frisch fails to teach or suggest obtaining a child image fitness value suitable for optimizing the digital image as recited in claim 1, from which claim 2 depends.

Watanabe discloses an optimization adjusting method and apparatus that allows a user the ability to evaluate solution vectors and "determine a fitness factor for each solution vector with respect to the problem at hand." (see col. 22, lines 25-26). The user may output an "optimal solution vector, [i.e.,] a solution vector having the highest fitness." (see col. 22, lines 28-30). The solution vectors having a higher fitness [value] are then applied to a recombination section that performs an arithmetical recombination operation. The recombination operation includes a selection range deriving section to limit the selection of the solution vector set.

No Motivation Exists for the Examiner's Proposed Modification

Contrary to the examiner position, there is neither a suggestion or motivation to develop the features of the present invention as recited in claim 2, for example. Frisch teaches a method for manually determining fitness values and updating digital images using a weighted average wherein the highest fitness value is used as the weighting factor. Frisch fails to disclose either an optimization unit for optimizing at least one control (claim 1) or an objective quality metric unit (claim 2). In fact, Frisch specifically acknowledges that the method proposed is a subjective method. (see page 11, lines 19-22) and fails to discuss or suggest any method for optimizing at least one parameter setting or an objective quality metric unit.

Watanabe discloses a user enabled system for determining fitness values for solution vectors and then selecting, for further processing, solution vectors associated with the highest fitness value. Accordingly, Watanabe also provides for a subjective method for determining fitness values which are used in subsequent calculations. Hence, one would not be motivated to combine the teachings of Frisch and Watanabe as neither describes an objective quality metric unit capable of determining a fitness value, as is recited in the claims.

The law is clear that there must be some teaching in the references to support their use in the particular claimed combination. See Smithkline Diagnostics, Inc., v. Helena Labs Corp., 859 F.2d 878, 887, 8 USPQ 2d 1468, 1475 (Fed. Cir. 1988). Nothing in Frisch or Watanabe teaches or suggests an objective quality metric unit as is recited in claim 2.

In the matter of obviousness, the court has found that:

> an examiner ... may often find every element of a claimed invention in the prior art. If identification of each claimed element of the prior art

> was sufficient to negate patentability, very few patents would ever issue. Furthermore rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner ... to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention ... To counter this potential weakness in the obviousness construct, the suggestion to combine requirements stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness. Yamanouchi Pharmaceutical Co. v. Danbury Pharmacal, Inc. 231 F. 3d. 1339, 56 USPQ2d. 1641, 1644 (Fed. Cir. 2000). quoting In re Ruffet, 149 F.3d 1350, 1357-58, 47 USPQ 2d 1453, 1457 (Fed. Cir. 1998)."

In this case, applicant believes that the examiner's proposed modification of Frisch is an impermissible use of the present invention as a blueprint to combine the teachings of the cited references, even though neither reference suggests the elements claimed. In this case, Frisch fails to teach or suggest an objective quality metric and while Watanabe teaches a unit for determining a fitness value, Watanabe is silent on the determination being made by an objective quality metric unit.

In view of the above, applicant submits that claim 2 is patentable over the teachings of Frisch and Watanabe.

With regard to claims 3-5, these claims ultimately depend from claim 1 and/or claim 2, which have been shown to include subject matter not disclosed or suggested by Frisch and/or Watanabe. Accordingly, claims 3-5 are also patentable over the teachings of Frisch and Watanabe by virtue of their dependency upon allowable base claims.

With regard to claims 7-11, 13, 15-17 and 20-22, these claims ultimately depend from independent claims 6 and 18 and contain subject matter similar to that described in claims 2-5. Accordingly, these claims are also patentable over the teachings of Frisch and Watanabe by virtue of their dependency upon allowable base claims and for the remarks made with regard to claims 2-5.

With regard to claim 24, the examiner has not provided a reason for rejecting this claim. However, this claim recites subject matter similar to that recited in claim 13. Hence, for the same remarks made with regard to claim 13, applicant submits that claim 24 is not rendered obvious in view of the cited references.

With regard to claim 14, this claim recites genetic algorithms capable of optimizing control parameter settings and objective quality metric units for determining fitness values, which is similar to the subject matter recited in claims 1 and 2. Accordingly, in view of the remarks made with regard to claims 1 and 2, which are reasserted, as if in full, herein, applicant submits that claim 14 is patentable over Frisch and Watanabe.

In view of the above, applicant submits that claims 2-5, 7-11, 13-17 and 20-22 are patentable over the teachings of Frisch and Watanabe.

Examiner's Proposed Modification of Frisch Fails to Arrive at the Present Invention

To establish a prima facie case of obviousness of a claimed invention, all the claim limitations must be taught or suggested in the prior art. See *In re* Royka, 490 F. 2d 981, 180 USPQ 580 (CCPA 1975). The examiner's proposed modification of Frisch with the teachings of Watanabe fails to establish a prima facie case of obviousness because, even if there were some motivation to combine the teachings of the cited reference, the combination of Frisch and Watanabe fails to disclose all the subject matter recited in the claims. As recited above, neither Frisch nor Watanabe disclose an optimizing unit optimizing at least one control parameter or an objective quality metric unit as has been shown. Rather, the combined device would dynamically determine fitness values and merely remove the burden

from the user to determine a fitness value. The weighted average method of updating the digital image would remain as is disclosed by Frisch.

In view of the above, applicant submits that claims 2-5, 7-11, 13-17 and 20-23 are patentable over the teachings of Frisch and Watanabe.

III. Rejection Under 35 USC §103(a) in view of Frisch, Watanabe and Sims

Claims 12 and 23 are rejected under 35 USC 103(a) as being unpatentable over the combination of Frisch and Watanabe as applied to claims 11 and 22 and further in view of Sims.

Sims describes how evolutionary techniques of variation and selection can be used to create complex simulated structures, textures and motions for use in computer graphics and animation. Interactive selection based on visual perception of procedurally generated results allows the user to direct simulation evolutions in preferred directions. However, Sims is silent on a system for optimizing at least one control parameter setting, as is recited in the claims. Accordingly, the combination of Frisch, Watanabe and Sims would not disclose all the elements recited in independent claims 1, 6 or 18.

Claim 12 depends from claim 11, which ultimately depends from independent claim 6 and claim 23 depends from claim 22, which ultimately depends from independent 18. Claims 6 and 18 have been shown to contain subject matter not disclosed or suggested by Frisch, Watanabe and Sims. Accordingly, claims 12 and 23 would similarly contain subject matter not disclosed by the combination of Frisch, Watanabe and Sims.

In view of the above, applicant submits that claims 12 and 23 are patentable over the teachings of Frisch, Watanabe and Sims.

For at least all of the above reasons, the proposed combination of prior art references would not have rendered obvious the present invention.

IX. CONCLUSION

In view of the above analysis, it is respectfully submitted that the referenced teachings, whether taken individually or in combination, fail to anticipate or render obvious the subject matter of any of the present claims. Therefore, reversal of all outstanding grounds of rejection is respectfully solicited.

Respectfully submitted,

Russell Gross
Registration No. 40,007

Date: December 28, 2004

By: Steve Cha
Attorney for Applicant
Registration No. 44,069

X. APPENDIX: THE CLAIMS ON APPEAL

1. For use in a video processing system of the type comprising a chain of video processing algorithms for processing a video stream, a system for optimizing at least one control parameter setting of at least one of said video processing algorithms in said chain of video processing algorithms, said system comprising:

an optimization unit comprising an algorithm capable of optimizing said at least one control parameter setting of said at least one video processing algorithm.

2. The system as claimed in Claim 1 further comprising an objective quality metric unit coupled to said optimization unit, said objective quality metric unit capable of receiving an output video stream from said chain of video processing algorithms, and capable of determining a fitness value that characterizes the video quality of said output video stream, and capable of providing said fitness value to said algorithm in said optimization unit.

3. The system as claimed in Claim 2 wherein said algorithm in said optimization unit optimizes said at least one control parameter setting of said at least one video processing algorithm using said fitness value.

4. The system as claimed in Claim 1 wherein said optimization unit comprises an algorithm that is capable of optimizing a plurality of control parameter settings of each of a plurality of video processing algorithms in said chain of video processing algorithms.

5. The system as claimed in Claim 4 further comprising an objective quality metric unit coupled to said optimization unit, said objective quality metric unit capable of receiving an output video stream from said chain of video processing algorithms, and capable of

determining a fitness value that characterizes the video quality of said output video stream, and capable of providing said fitness value to said algorithm in said optimization unit.

6. For use in a video processing system of the type comprising a chain of video processing algorithms for processing a video stream, a system for optimizing at least one control parameter setting of at least one of said video processing algorithms in said chain of video processing algorithms, said system comprising:

a genetic algorithm unit comprising a genetic algorithm capable of optimizing said at least one control parameter setting of said at least one video processing algorithm.

7. The system as claimed in Claim 6 further comprising an objective quality metric unit coupled to said genetic algorithm unit, said objective quality metric unit capable of receiving an output video stream from said chain of video processing algorithms, and capable of determining a fitness value that characterizes the video quality of said output video stream, and capable of providing said fitness value to said genetic algorithm in said genetic algorithm unit.

8. The system as claimed in Claim 7 wherein said genetic algorithm in said genetic algorithm unit optimizes said at least one control parameter setting of said at least one video processing algorithm using said fitness value.

9. The system as claimed in Claim 6 wherein said genetic algorithm unit comprises a genetic algorithm that is capable of optimizing a plurality of control parameter settings of each of a plurality of video processing algorithms in said chain of video processing algorithms.

10. The system as claimed in Claim 9 further comprising an objective quality metric unit coupled to said genetic algorithm unit, said objective quality metric unit capable of receiving an output video stream from said chain of video processing algorithms, and capable of determining a fitness value that characterizes the video quality of said output video stream, and capable of providing said fitness value to said genetic algorithm in said genetic algorithm unit.

11. The system as claimed in Claim 10 wherein said genetic algorithm in said genetic algorithm unit optimizes a plurality of control parameter settings of a plurality of said video processing algorithms using said fitness value.

12. The system as claimed in Claim 11 wherein at least one of said plurality of control parameter settings comprises the order of application of said video processing algorithms in said chain of video processing algorithms.

13. The system as claimed in Claim 11 wherein at least one of said plurality of control parameter settings of said video processing algorithms comprises one of: a bit precision parameter, a noise reduction parameter, and a peaking parameter.

14. For use in a video processing system of the type comprising a plurality of chains of video processing algorithms for processing a plurality of video streams, a system for optimizing a plurality of control parameter settings of a plurality of video processing algorithms in said plurality of chains of video processing algorithms, said system comprising:

a plurality of genetic algorithm units coupled to said plurality of parallel chains of video processing algorithms, each of said plurality of genetic algorithm units comprising a genetic algorithm capable of optimizing said plurality of control parameter settings of said plurality of video processing algorithms; and

a plurality of objective quality metric units, each of said plurality of objective quality metric units coupled to one of said plurality of genetic algorithm units, each of said plurality of objective quality metrics capable of receiving an output video stream from one of said plurality of chains of video processing algorithms, and capable of determining a fitness value that characterizes the video quality of said output video stream, and capable of providing said fitness value to a genetic algorithm in a genetic algorithm unit to which said objective quality metric unit is coupled;

wherein said genetic algorithm in each of said plurality of genetic algorithm units optimizes a plurality of control parameter settings of said plurality of video processing algorithms using said fitness values.

15. The system as claimed in Claim 6 comprising a genetic algorithm in which candidate solutions that will not provide an improvement in video quality are excluded.

16. The system as claimed in Claim 6 comprising a genetic algorithm in which a limited number of representative candidate solutions that are likely to provide an improvement in video quality are considered.

17. The system as claimed in Claim 6 comprising a genetic algorithm in which candidate solutions are considered that derive from previously existing desirable candidate solutions that are likely to provide an improvement in video quality.

18. For use in a video processing system of the type comprising a chain of video processing algorithms for processing a video stream, a method for optimizing at least one control parameter setting of at least one of said video processing algorithms in said chain of video processing algorithms, said method comprising the step of:

using an algorithm in an optimization unit to optimize, said at least one control parameter setting of said at least one of said video processing algorithms.

19. The method as claimed in Claim 18 wherein said algorithm comprises a genetic algorithm.

20. The method as claimed in Claim 19 further comprising the steps of:

receiving an output video stream from said chain of video processing algorithms in an objective quality metric unit;

determining in said objective quality metric unit a fitness value for said output video stream;

providing said fitness value to said genetic algorithm; and

using said fitness value in said genetic algorithm to optimize said at least one control parameter setting of said at least one of said video processing algorithms.

21. The method as claimed in Claim 19 wherein said genetic algorithm is capable of optimizing a plurality of control parameter settings of each of a plurality of video processing algorithms in said chain of video processing algorithms.

22. The method as claimed in Claim 21 further comprising the steps of:

receiving an output video stream from said chain of video processing algorithms in objective quality metric unit;

determining in said objective quality metric unit a fitness value for said output video stream;

providing said fitness value to said genetic algorithm; and

using said fitness value in said genetic algorithm to optimize said plurality of control parameter settings of a plurality of said video processing algorithms.

23. The method as claimed in Claim 22 wherein at least one of said plurality of control parameter settings comprises the order of application of said video processing algorithms in said chain of video processing algorithms.

24. The method as claimed in Claim 22 wherein at least one of said plurality of control parameter settings of said video processing algorithms comprises one of: a bit precision parameter, a noise reduction parameter, and a peaking parameter.

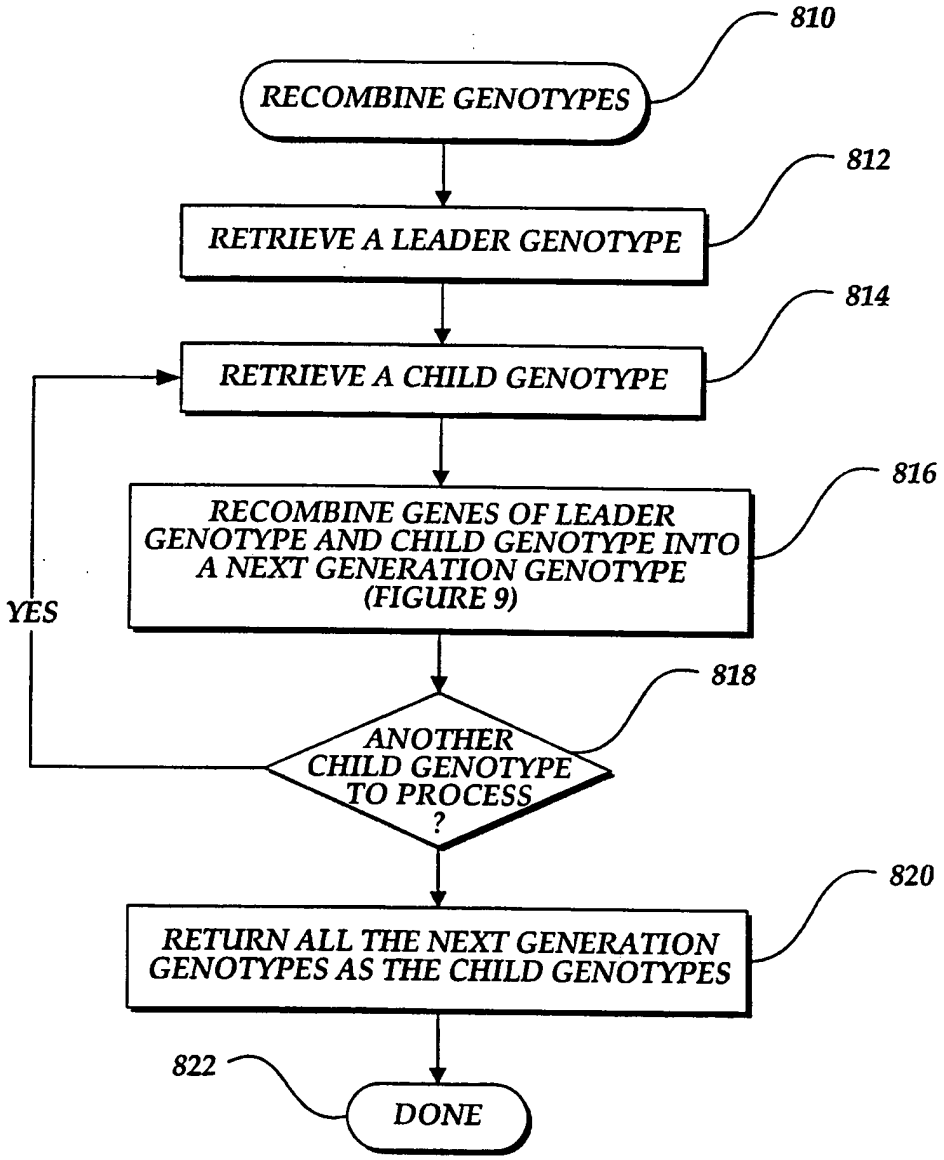
810
RECOMBINE GENOTYPES
812
RETRIEVE A LEADER GENOTYPE
814
RETRIEVE A CHILD GENOTYPE
816
RECOMBINE GENES OF LEADER GENOTYPE AND CHILD GENOTYPE INTO A NEXT GENERATION GENOTYPE (FIGURE 9)
818
ANOTHER CHILD GENOTYPE TO PROCESS ?
YES
820
RETURN ALL THE NEXT GENERATION GENOTYPES AS THE CHILD GENOTYPES
822
DONE

Fig.8.

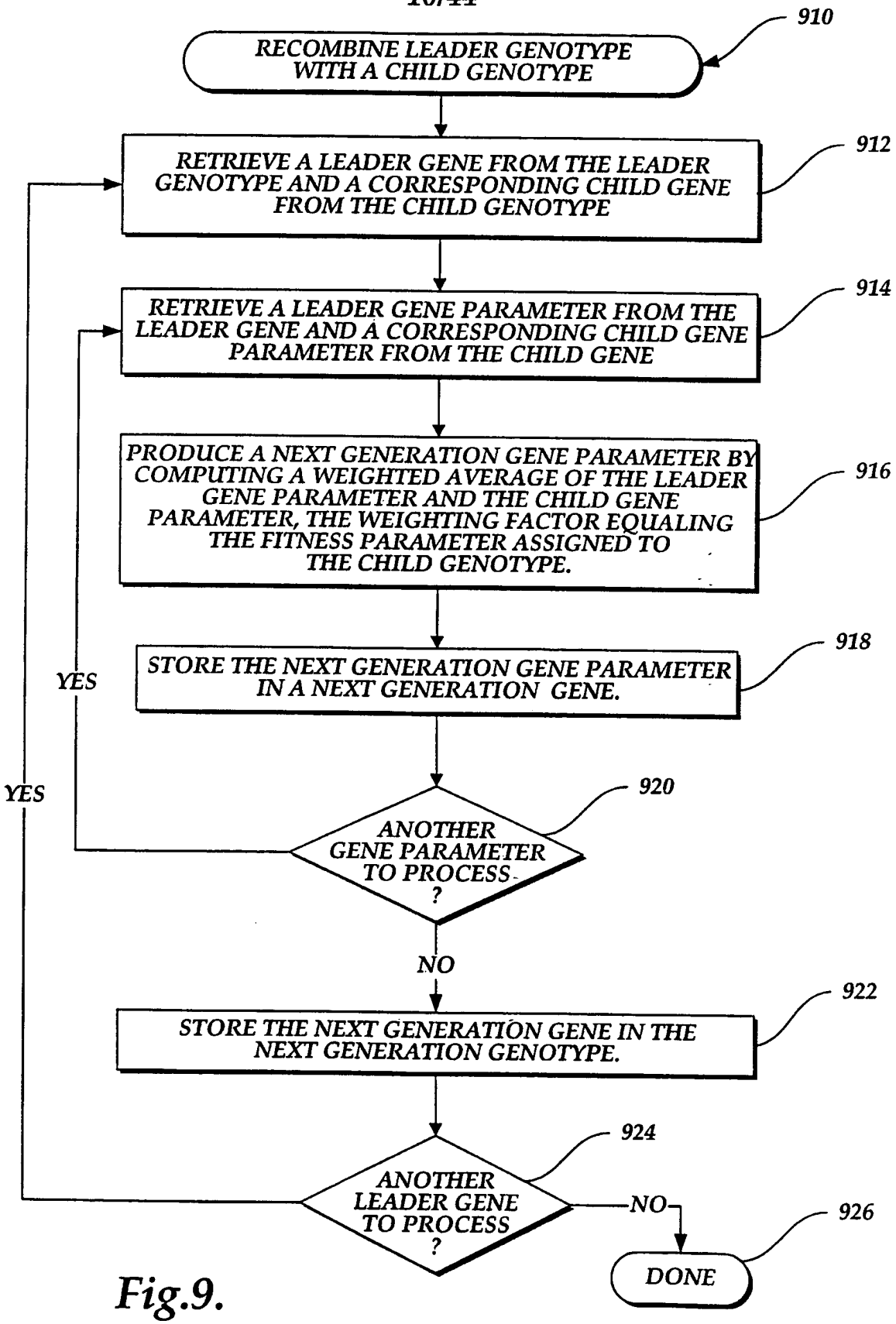
910
RECOMBINE LEADER GENOTYPE WITH A CHILD GENOTYPE
912
RETRIEVE A LEADER GENE FROM THE LEADER GENOTYPE AND A CORRESPONDING CHILD GENE FROM THE CHILD GENOTYPE
914
RETRIEVE A LEADER GENE PARAMETER FROM THE LEADER GENE AND A CORRESPONDING CHILD GENE PARAMETER FROM THE CHILD GENE
916
PRODUCE A NEXT GENERATION GENE PARAMETER BY COMPUTING A WEIGHTED AVERAGE OF THE LEADER GENE PARAMETER AND THE CHILD GENE PARAMETER, THE WEIGHTING FACTOR EQUALING THE FITNESS PARAMETER ASSIGNED TO THE CHILD GENOTYPE.
918
STORE THE NEXT GENERATION GENE PARAMETER IN A NEXT GENERATION GENE.
YES
920
ANOTHER GENE PARAMETER TO PROCESS ?
YES
NO
922
STORE THE NEXT GENERATION GENE IN THE NEXT GENERATION GENOTYPE.
924
ANOTHER LEADER GENE TO PROCESS ?
NO
926
DONE

Fig.9.